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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/803,801

03/12/2001

Khalil Camille Haddad

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11/16/2006

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EXAMINER

PERILLA, JASON M

ART UNIT

PAPER NUMBER

2611

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/803,801

Applicant(s)

HADDAD, KHALIL CAMILLE

Examiner

Jason M. Perilla

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-16, 18-26 and 28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-16, 18-26 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-8, 10-16, 18-26 and 28 are pending in the instant application.

Response to Amendment/Argument

2. Applicant's arguments filed May 12, 2006 have been fully considered but they are not persuasive. Nonetheless, to perfect the Examiner's application of the prior art to the instant application for appeal, a new grounds of rejection is made incorporating Nedic et al (U.S. Pat. No. 6563841). Therefore, applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

3. With respect to the Applicants statement that Khalil C. ("Constrained FIR Filter Design by the Method of Vector Space Projections", Haddad, Khalil C. et al; hereafter "Khalil") does not constitute prior art under 35 U.S.C. § 103(a) because, supposedly, it does not apply as prior art under 35 U.S.C. § 102(a), the argument is not persuasive. The incorporation by reference of Kahlil into the instant application does not bar it's use as a reference under 35 U.S.C. § 102(a). Furthermore, Kahlil constitutes prior art under 35 U.S.C. § 102(a) because it is "known by others". That is, the inventors of the instant application are not the same as writers of the prior art reference Kahlil.

4. In view of the appeal brief filed on October 24, 2005, PROSECUTION IS HEREBY REOPENED. New art rejections are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 4-6, 10-12, 14-16, and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nedic et al (U.S. Pat. No. 6563841; hereafter "Nedic") in view of Haddad et al ("Design of Digital Linear-Phase FIR Crossover Systems of Loudspeakers by the Method of Vector Space Projections", Haddad, Khalil C. et al; hereafter "Haddad" – previously cited).

Regarding claim 1, Nedic discloses a time domain filter (fig. 1, ref. 32) which is comprised of a shortening finite impulse response filter (FIR) or "shortening impulse response filter" (SIRF) to compensate for the non-ideal response of a transmission channel. (col. 2, lines 51-65). Nedic discloses that the SIRF filter employs a finite number of coefficients to compensate for the transmission channel. Nedic does not

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explicitly disclose a method of determining the values of the coefficients via vector space projection methods (VSPM). However, Haddad teaches an exemplary method of designing a finite impulse response (FIR) filter (title; pg. 3058, col. 2, lines 15-16), said method comprising the steps of: establishing at least one set of defining constraints that said filter must satisfy in a time domain (pg. 3060, col. 2, line 9-15; equ. 11); establishing at least one set of defining constraints that said filter must satisfy in a frequency domain (pg. 3060, col. 1, line 26 – col. 2, line 9; equ. 8, 9, and 10); and determining an intersecting set of said at least one set of defining constraints that said filter must satisfy in the time domain and said at least one set of defining constraints that said filter must satisfy in the frequency domain (pg. 3059, col. 2, lines 39-44; pg. 3060, fig. 2). Haddad teaches a method to solve a mathematical problem encompassing multiple constraints by vector space projection (page 3059, lines 10-16). Haddad further teaches that the desired result of using the vector space projection method (VSPM) is the "solution set" or the set that satisfies all the constraints (page 3059, lines 38-42; fig. 2) and that the VSPM method has significant flexibility in that any number of constraints may be incorporated (page 3063, lines 8-11). Because an SIRF filter is a particular type of FIR filter, one skilled in the art would be motivated to use Haddad's exemplary coefficient determining method for SIRF filters (such as that of Nedic) as well as FIR filters. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize the VSPM method of Haddad to determine the shortening impulse response SIRF filter of Nedic because designing an

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SIRF filter using VSPM methods would allow for flexible design using multiple constraints.

Regarding claim 2, Nedic in view of Haddad disclose the limitations of claim 1 as applied above. Further, Haddad discloses that said at least one set of defining constraints that said filter must satisfy in the time domain define a filter having a linear phase response (pg. 3060, eq. 11, col. 2, lines 26-28).

Regarding claim 4, Nedic in view of Haddad disclose the limitations of claim 1 as applied above. Further, Haddad discloses that the time domain constraints specify a length of the impulse response L (pg. 3060, eq. 11, col. 2, lines 26-28) and Nedic discloses that an SIRF filter shortens a channel impulse response. (col. 2, lines 51-65). Therefore, in the method of Haddad in view of Nedic, VSPM would be utilized to shorten the impulse response of the SIRF filter via the time domain constraints.

Regarding claim 5, Nedic in view of Haddad disclose the limitations of claim 1 as applied above. Further, Haddad discloses that the frequency domain constraints include a frequency response for the SIRF filter that does not attenuate a received signal (fig. 3). Figure 3 of Haddad illustrates frequency domain attenuation regions for various filters which do not attenuate a received signal because they have a flat magnitude response.

Regarding claim 6, Nedic in view of Haddad disclose the limitations of claim 1 as applied above. Further, Haddad discloses that the frequency domain constraints include a pass-band for said SIRF filter (fig. 3.). Figure 3 of Haddad illustrates frequency domain attenuation regions for various filters which include pass-band

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regions because they have a flat magnitude response or pass-band over a range of frequencies.

Regarding claim 10, Nedic in view of Haddad disclose the limitations of claim 1 as applied above. Further, Haddad discloses that the VSPM method is iteratively applied between the time and frequency domain constraints until the sets converge (fig. 2).

Regarding claim 11, Nedic in view of Haddad disclose the limitations of the claim as applied to claim 1 above.

Regarding claim 12, Nedic in view of Haddad disclose the limitations of claim 11 as applied above. Further, Nedic in view of Haddad disclose the remaining limitations of the claim as applied to claim 2 above.

Regarding claim 14, Nedic in view of Haddad disclose the limitations of claim 11 as applied above. Further, Nedic in view of Haddad disclose the remaining limitations of the claim as applied to claim 4 above.

Regarding claim 15, Nedic in view of Haddad disclose the limitations of claim 11 as applied above. Further, Nedic in view of Haddad disclose the remaining limitations of the claim as applied to claim 5 above.

Regarding claim 16, Nedic in view of Haddad disclose the limitations of claim 11 as applied above. Further, Nedic in view of Haddad disclose the remaining limitations of the claim as applied to claim 6 above.

Regarding claim 18, Nedic in view of Haddad disclose the limitations of claim 11 as applied above. Further, Nedic in view of Haddad disclose the remaining limitations of the claim as applied to claim 10 above.

7. Claims 19, 20, 22-24, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nedic in view of Haddad, and in further view of Gandhi et al (US 6112218; hereafter "Ghandi" – previously cited).

Regarding claim 19, Nedic in view of Haddad disclose a method for determining coefficient values for a shortening impulse response filter (SIRF) as applied to claim 1 above. Although digital signal processors (DSP) executing instructions stored on memory communicatively coupled to them are notoriously known for implementing inventions which process digital information, Nedic in view of Haddad do not disclose the use of one. However, Ghandi does teach the use of a DSP and a memory for implementing a filter (abstract; col. 18, lines 28-35). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize a memory and a DSP as taught by Ghandi in the method of Nedic in view of Haddad because it provides an exceptionally flexible means to implement the filter.

Regarding claim 20, Nedic in view of Haddad, and in further view of Gandhi disclose the limitations of claim 19 as applied above. Further, Haddad discloses that said at least one set of defining constraints that said filter must satisfy in the time domain define a filter having a linear phase response (pg. 3060, eq. 4, col. 2, lines 26-28).

Regarding claim 22, Nedic in view of Haddad, and in further view of Gandhi disclose the limitations of claim 19 as applied above. Further, Haddad discloses that the time domain constraints specify a length of the impulse response L (pg. 3060, eq. 11, col. 2, lines 26-28) and Nedic discloses that an SIRF filter shortens a channel impulse response. (col. 2, lines 51-65). Therefore, in the method of Haddad in view of Nedic, VSPM would be utilized to shorten the impulse response of the SIRF filter via the time domain constraints.

Regarding claim 23, Nedic in view of Haddad, and in further view of Gandhi disclose the limitations of claim 19 as applied above. Further, Haddad discloses that the frequency domain constraints include a frequency response for the SIRF filter that does not attenuate a received signal (fig. 3). Figure 3 of Haddad illustrates frequency domain attenuation regions for various filters which do not attenuate a received signal because they have a flat magnitude response.

Regarding claim 24, Nedic in view of Haddad, and in further view of Gandhi disclose the limitations of claim 19 as applied above. Further, Haddad discloses that the frequency domain constraints include a pass-band for said SIRF filter (fig. 3.). Figure 3 of Haddad illustrates frequency domain attenuation regions for various filters which include pass-band regions because they have a flat magnitude response or pass-band over a range of frequencies.

Regarding claim 28, Nedic in view of Haddad, and in further view of Gandhi disclose the limitations of claim 19 as applied above. Further, Haddad discloses that

the VSPM method is iteratively applied between the time and frequency domain constraints until the sets converge (fig. 2).

8. Claims 3, 7, 8, 13, 21, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nedic in view of Haddad, and in further view of Haddad, Khalil C. ("Constrained FIR Filter Design by the Method of Vector Space Projections", Haddad, Khalil C. et al; hereafter "Khalil" – previously cited).

Regarding claim 3, Nedic in view of Haddad disclose the limitations of claim 1 as applied above. Nedic in view of Haddad do not disclose that said at least one set of defining constraints that said filter must satisfy in the frequency domain define a filter having a non-linear phase response. However, Khalil teaches a VSPM method wherein a filter is designed having an arbitrary magnitude and phase response (page 719, col. 1, lines 20-40; col. 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to create a filter with an arbitrary magnitude and phase response as suggested by Khalil depending upon the desired filter response. Applicant has not disclosed that the particular set of constraints provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with several different types of magnitude and phase response because the VSPM method is very flexible. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to design a filter having an arbitrary magnitude and phase response as suggested by Khalil in the method of Nedic in view of Haddad because it represents an arbitrary design which is flexible.

Regarding claim 7, Nedic in view of Haddad disclose the limitations of claim 2 as applied above. Nedic in view of Haddad do not disclose the particular set of defining constraints as further limited in the claim. However, Khalil teaches a VSPM method wherein a filter is designed according to the set of constraints (page 716, col. 1, lines 20-40; col. 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to utilize the particular set of defining constraints as suggested by Khalil depending upon the desired filter response. Applicant has not disclosed that the particular set of constraints provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with several different types of constraint sets because the VSPM method is very flexible. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize the set of constraints as suggested by Khalil in the method of Nedic in view of Haddad because it represents an arbitrary design which is flexible.

Regarding claim 8, Nedic in view of Haddad disclose the limitations of claim 3 as applied above. Nedic in view of Haddad do not disclose the particular set of defining constraints as further limited in claim the claim. However, Khalil teaches a VSPM method wherein a filter is designed according to the set of constraints (page 716, col. 1, lines 20-40; col. 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to utilize the particular set of defining constraints as suggested by Khalil depending upon the desired filter response. Applicant has not

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disclosed that the particular set of constraints provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with several different types of constraint sets because the VSPM method is very flexible. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize the set of constraints as suggested by Khalil in the method of Nedic in view of Haddad because it represents an arbitrary design which is flexible.

Regarding claims 13 and 21, the respective limitations of claims 11 and 19 are disclosed by Nedic in view of Haddad as applied above. Further, the additional limitations of claims 13 and 21 are disclosed by Khalil as applied to claim 3 above.

Regarding claims 25 and 26, the respective limitations of claims 20 and 21 are disclosed by Nedic in view of Haddad as applied above. Further, the additional limitations of claims 25 and 26 are disclosed by Khalil as applied respectively to claims 7 and 8 above.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jason M. Perilla
November 3, 2006

jmp


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SUPERVISORY PATENT EXAMINER